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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/674,735	09/30/2003	Vahid Tarokh	678-1256 (P10487)	3965
28249	7590	12/07/2006	EXAMINER	
DILWORTH & BARRESE, LLP 333 EARLE OVINGTON BLVD. UNIONDALE, NY 11553			TRAN, KHAI	
			ART UNIT	PAPER NUMBER
			2611	

DATE MAILED: 12/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/674,735

Applicant(s)

TAROKH ET AL.

Examiner

KHAI TRAN

Art Unit

2611

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 2 sheets.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. Claims 7-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 7, line 6, the term "the receivers" lacks antecedent basis; as set forth in claim 10, line 5

Claims 8-9, 11-12 are rejected under a similar rationale.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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4. Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Calderbank et al (U.S. Pat. 6,127,971) (cited by Applicant) in view of Foschini et al (US 2002/0142723 A1).

Regarding claim 1, Calderbank et al disclose a signal transmission apparatus as shown in Figure 1, in a mobile communication system, comprising: a frame segmentation section for segmenting an input frame into k bit groups (incoming frames of bits are applied to serial to parallel (S/P) converter 100), Calderbank et al disclose a first, second and third encoders (110, 120, 130) corresponding to the frames of bits; a transmission section including a plurality of antennas in groups of a predetermined number of antennas, the number N of the antennas being larger than k, the transmission section transmitting the symbols encoded by each of the encoders in the second group via at least one antenna of the grouped antennas (110-1, 110-2 ... 110-3). Calderbank et al also disclose the number of the antennas being larger than k, wherein k: k bit groups of the encoders (the number of antennas (2) for each group of the encoder. So there are two antennas while the group has only k bit group). Therefore, the number N of the antennas being larger than k as recited in the claim. Calderbank et al fail to disclose a first group of encoders for encoding the k bit groups and outputting encoded symbols; a second group of encoders for encoding at least two bit groups among the k bit groups and outputting encoded symbols.

Foschini et al disclose groups of the encoders/modulator (CODE/MOD) (630-11 ... 630-44 are divided into groups of Encoder/Modulator elements, see Figure 6, wherein each group contains four Encoder/Modulator elements. There are four groups

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of encoder/modulator. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Calderbank's system by utilizing a first group of encoders for encoding the k bit groups and outputting encoded symbols; a second group of encoders for encoding at least two bit groups among the k bit groups and outputting encoded symbols as taught Foschini et al for transmitting sub-stream at different bit rates from each other (see [0061]). The motivation would enable the optimal bit rates and power levels can be selected to increase the maximum bit rate of the overall processed sub-system.

Regarding claim 2, Calderbank et al disclose wherein the encoders are trellis encoders (col. 6, lines 56-65).

Regarding claim 3, Foschini et al disclose wherein the total sum N_k of numbers of antennas in the groups of antennas is larger than N (see Figure 6).

Claims 4-6 are similar to claims 1-3. Therefore, claims 406 are rejected under a similar rationale.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 7, 9, 10, 12 are rejected under 35 U.S.C. 102(e) as being anticipated by Tamaki et al (US 2003/0124976 A1).

Regarding claim 7, Tamaki et al disclose a signal reception apparatus in a mobile communication system as shown in Figure 17, comprising: M antennas (1701a, 1701b, 1701 c) connected to a receiver; k decoders (1709a, 1709b), k being smaller than M (there are three antennas 1701a, 1701b, 1701 c); a decomposer (MIMO demodulators 1011a, 1010b, P/S converters 1011a, 1011b) for decomposing at least one reception symbol of M reception symbols output from the receivers and outputting the decomposed symbol to at least two of the decoders.

Regarding claim 9, Tamaki et al disclose wherein the antennas are groups of a predetermined number of antennas (see Figure 17).

Claim 10, 12 are similar to claims 7, 9

Claim Rejections - 35 USC § 103

7. Claims 8, 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tamaki et al. (US 2003/0124976 A1).

Regarding claims, 8, 11, Tamaki et al fail to disclose wherein the decoders are trellis decoder. However, the trellis decoders are well known in the art. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the trellis decoder into the teachings of Tamaki et al in order to determine a phase received from the transmitter and recover original signal.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Chizhik et al (U.S. Pat. 6,999,724) disclose a slowing the observed rate of channel fluctuations in a multiple antenna system.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to KHAI TRAN whose telephone number is (571) 272-3019. The examiner can normally be reached on 7:00AM - 4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, JAY PATEL can be reached on (571) 272-2988. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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A handwritten signature in black ink, appearing to read 'Khai Tran', with a stylized, cursive script.

KHAI TRAN
Primary Examiner
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KT

December 05, 2006